

# JPSD Experiment/Test Bed Experimentation Plan

AMG 12

June 13th

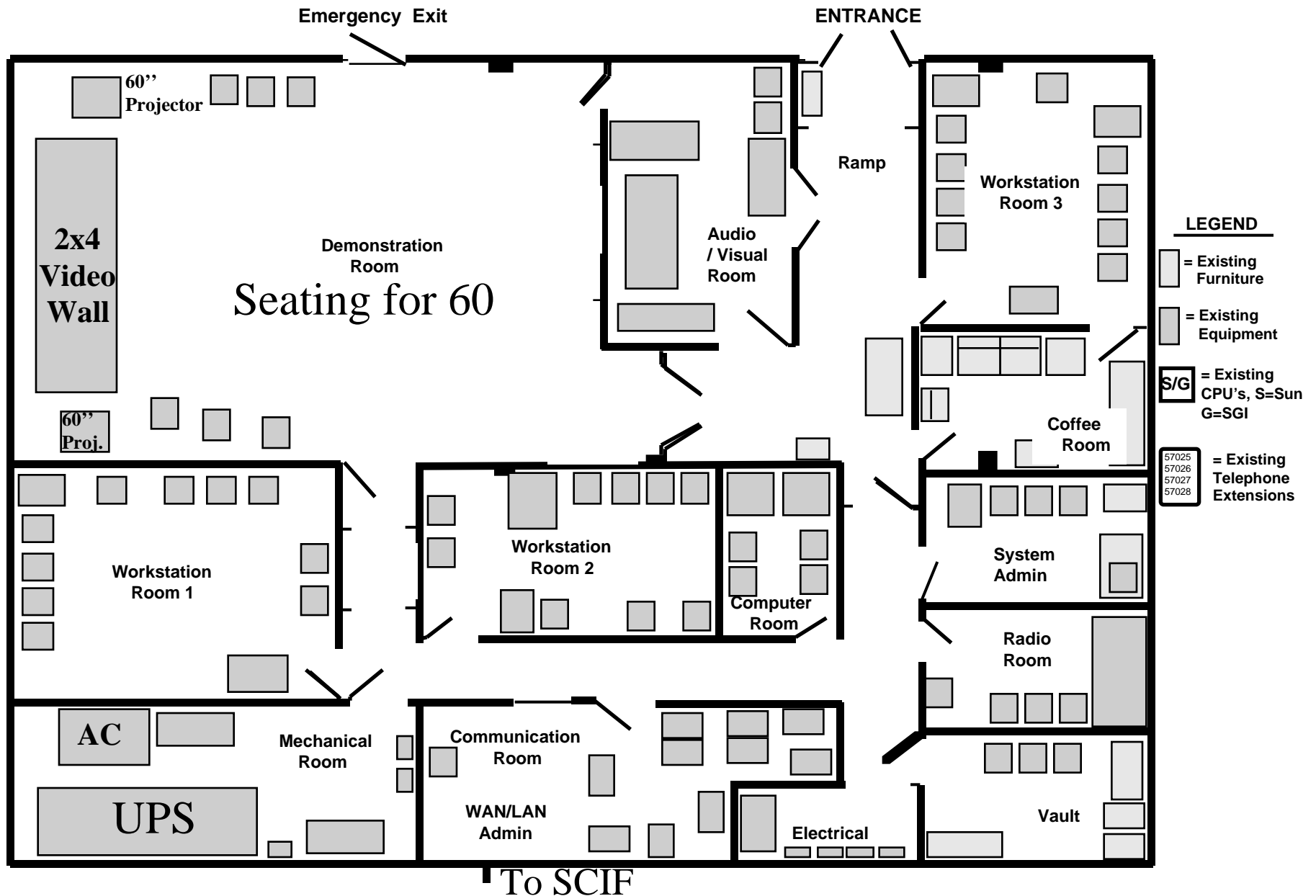
Russ Richardson

Rich Briggs

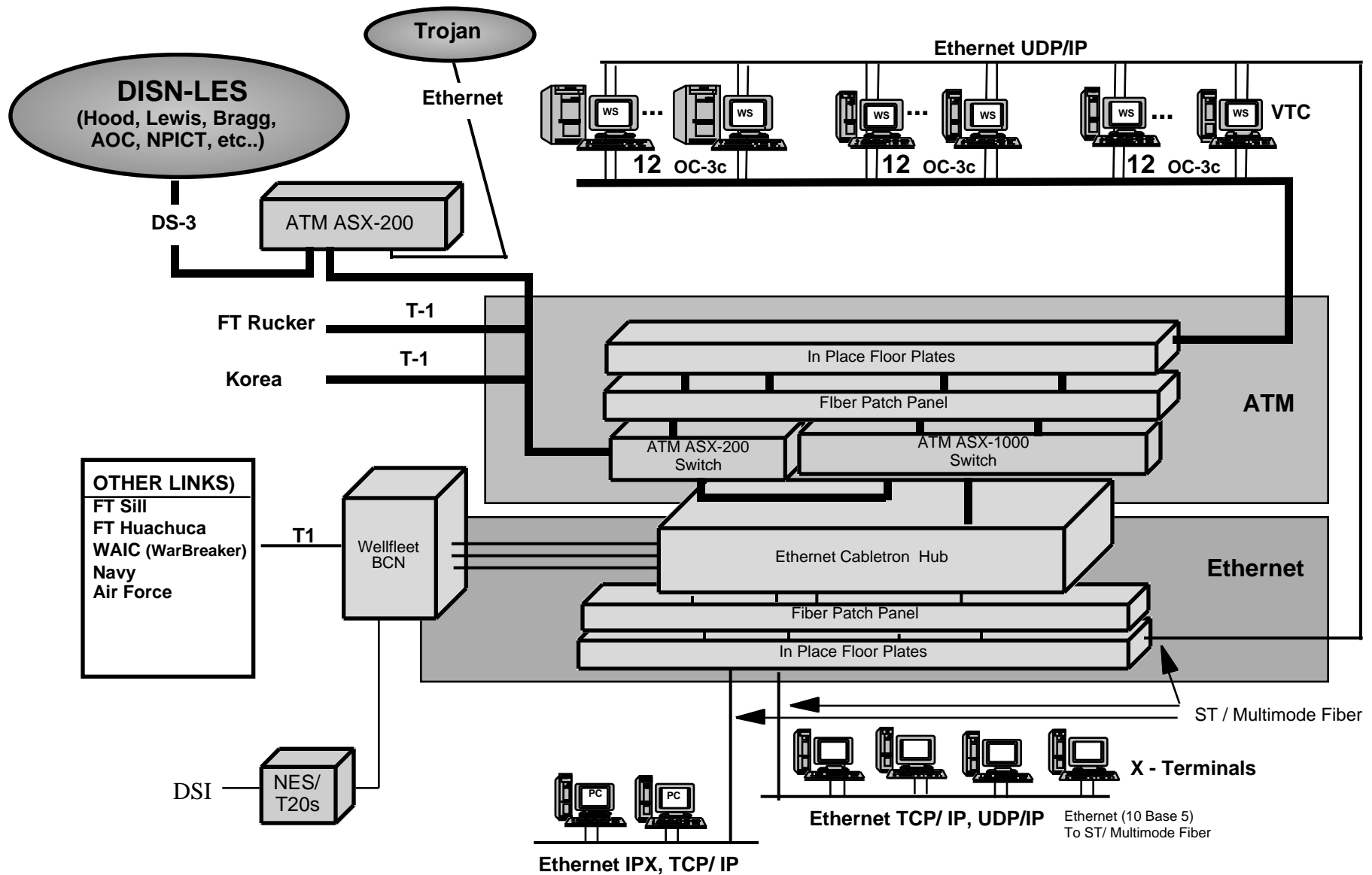
# JPSD Experimentation Plan

- IEC Facility
- Tools for Repeatable Experiment Execution
- Performance Measurement Infrastructure
- Experimentation Plan

# IEC Floor Plan



# IEC LAN Architecture



## **IEC Work Stations**

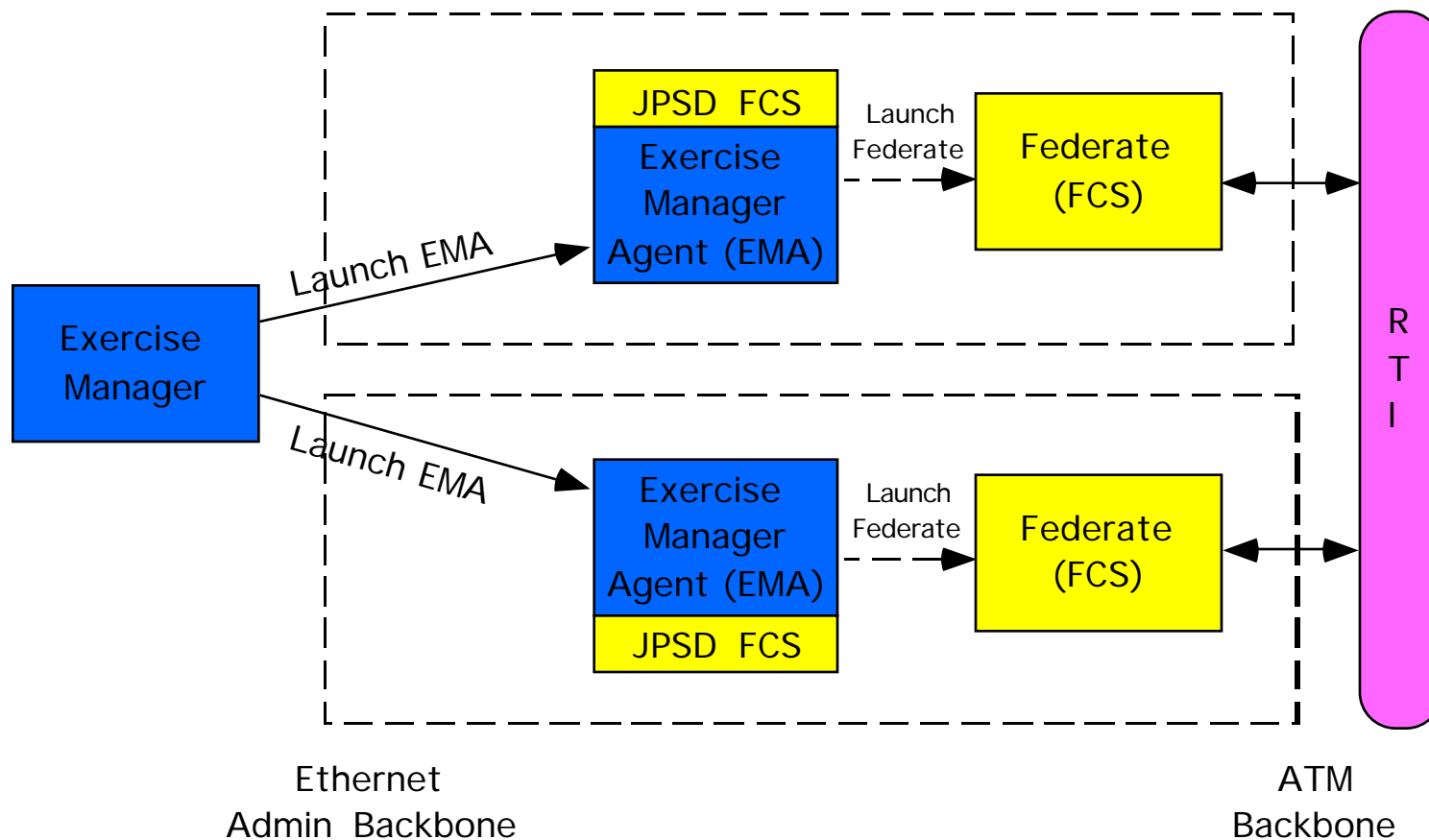
- 10 Ultra Sparcs (1 processor), 10 Ultra Sparc (2 processor)
- 8 Sun 514 (4 processor sparc 20s), 8 Sun 612 (2 processor)
- 20 Sun Sparc 20s, 10 Sparc 10s, 5 Sparc 2s
- 15 SGI Indigo Extremes, 2 Indys
- 5 SGI Onyxes, 2 Challenges
- 15 Pentium Pros (NT) PCs
- 1 HP
- 1 FAST terminal, 2 CTT radios
- In Addition we have three Development Sites
  - Boston---15 workstations
  - Springfield, Va -- 20 workstations
  - Arlington, Va -- 11 workstations\
- Over 200G of Storage plus an 80G RAID for Data Collection

At any One Time The IEC Can Have +/- 20% due to Exercise Support

# Tools for Repeatable Experiment Execution

- Exercise Manager
  - Existing software developed under JPSD
  - Automated experiment execution
  - Define exercise execution plan (FRED)
    - For each federate:
      - Simulation executable
      - Host to execute process on
      - Platform
      - Command line parameters (MOP Config file, terrain, etc.)
  - Self documenting experiment
- Atria Clearcase
  - Robust Configuration Management tool which allows multiple views of systems. View/execute any version of system by setting flag.

# Exercise Manager Architecture



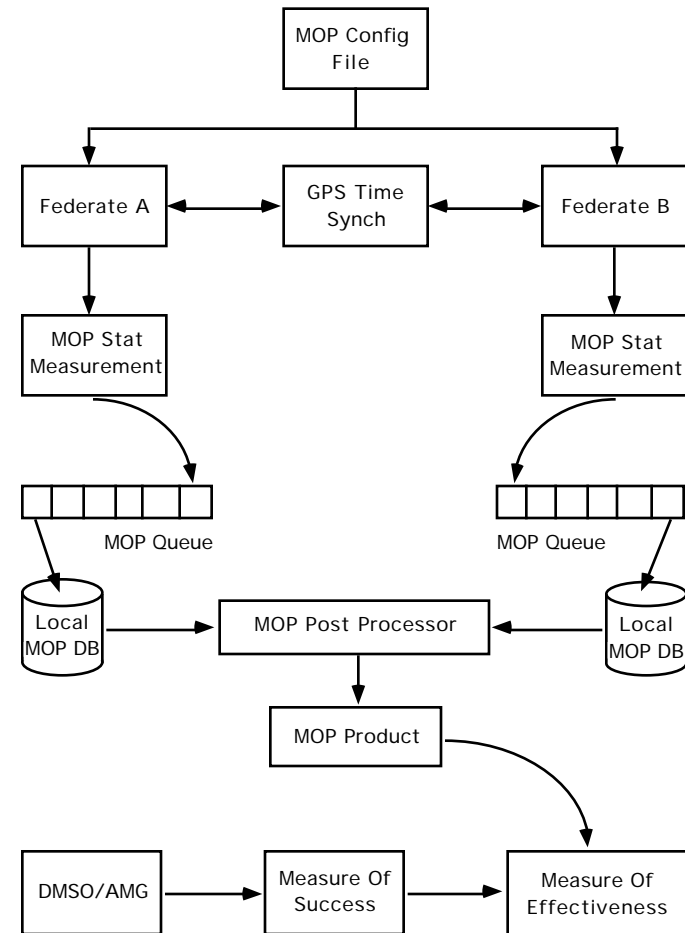
# Performance Measurement Infrastructure

- Goal: Measure and collect with as little intrusion as possible.
- Performance Framework Coverage
  - Latency
  - Resource utilization
  - Configuration
  - Control variables
- MOP Collection
  - Collect local to each host
  - Post-processor to merge results & perform initial MOEs

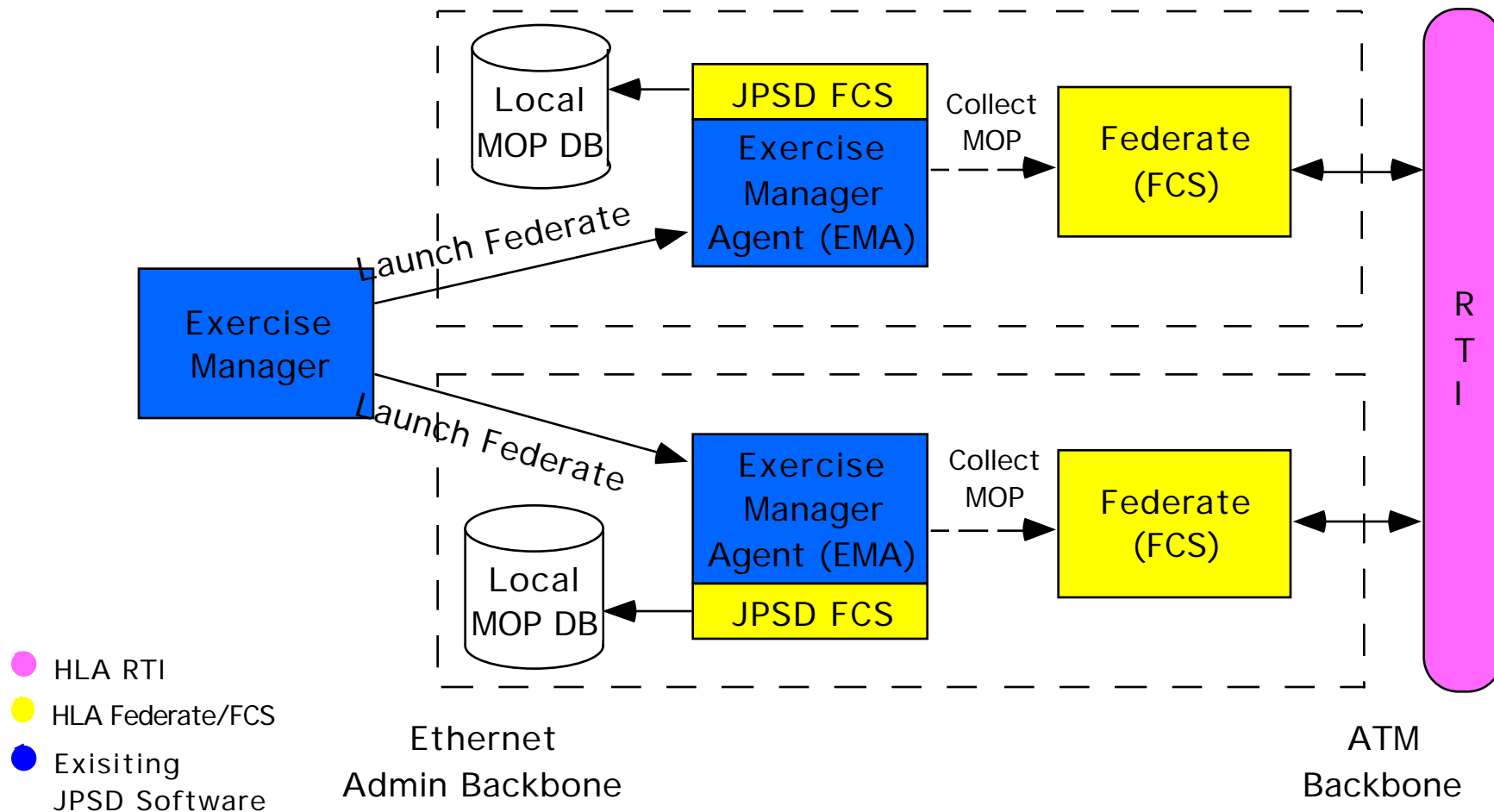


# Federate/RTI Performance Instrumentation

- FRS Instrumentation
  - Goal: Measure & collect with as little intrusion as possible
  - Log relevant RTI invocations for latency post-processing
  - Use separate thread for I/O to local DB to reduce intrusion
  - Support for compile & run-time selection of MOP's to collect
- Instrumentation Plan
  - Specifies required information for instrumentation of Performance Framework including Latency, Resource Utilization, Configuration & Control variables
  - Describes FCS instrumentation implementation including how to compile for MOPs and how to set up MOP config file for run-time selection



# Process/Host Performance Instrumentation



# Experimentation Plan

- RTI is a prototype: look for trends and scaling
- Many cycles of runs will be required
- Modified DoD 5000.2 TEMP
  - Leveraging off T&E Protofed's format & experiences
- Appendices
  - Scenario Description (ModSAF input files)
  - Instrumentation Plan (Draft)
  - FCS White paper (Draft in progress)
  - Filter Space Implementation Use Case
  - Exercise Manager Input files
    - ExMan launches all federates according to execution plan (Repeatable process)
    - System execution plan specifies the simulation, host, command-line arguments to execute for each simulation in exercise
  - FCS & MOP config files for each federate
  - JPSPD FOM & RID file

# For each experiment, document:

- Objectives -- i.e. questions that will be answered (e.g.)
  - Looking at RTI scaling as hosts increase
  - How well does filtering deal with 1000 tanks in parking lot
  - [Summary: define problem, limit scope of any given experiment to simple, measurable goals, few variables per experiment to aid analysis]
- Hypothesis -- what do we think will happen (and why)
- Assumptions (e.g. expected network/host characteristics)
- Data produced (meaning and format)
  - Coordinated with Performance Model group
  - Text file format used -- flexibility for multiple analysis tools
- System configuration tested (specified in ExMgr plans)
  - Model description
    - Brief scenario desc (ptr to detailed) [e.g. 100 red tanks, 100 blue, lines approaching]
    - Brief object desc (ptr to detailed) [e.g. tank, straight line motion, 10km fixed detect radius, behaviour: move to detected tanks, fire until dead]
  - RTI, OS, hardware versions